Distributed by:

JAMECO® ELECTRONICS

www.Jameco.com ✦ 1-800-831-4242

The content and copyrights of the attached material are the property of its owner.

Foreword

Introduction to this Book

Nuts & Volts Magazine is a 22-year old hobbyist electronics magazine. In 1995, editor Larry Lemieux asked Scott Edwards to start authoring a column on BASIC Stamp projects. The Stamp was an ideal fit for Nuts and Volts readers. Scott's handpicked replacement was Jon Williams, who left about one year of columns to Lon Glazner. Between them there's a tremendous set of applications, tips and hardware solutions with the BASIC Stamp.

The column has become a favorite of our hobbyist customers and now spans 75 issues. Every project from talking parrot pet trainers and measuring water level to distributed factory control has been detailed with BASIC Stamp programming tips sprinkled throughout.

The *Nuts & Volts of BASIC Stamps* is the collection of these columns.

The Stamp Applications Authors

Scott Edwards operates Scott Edwards Electronics (Seetron), manufacturer of Stamp-friendly serial display modules. His varied career includes stints as a newspaper reporter, Air Force communications technician, writer, editor, and electronic-toy designer. Visit his web site at www.seetron.com.

Jon Williams has become to be known as an entertainment author of Stamp Applications. Jon favors light, speech, sound and communication as key topics, and sometimes networking. Jon's BASIC Stamp code is both meticulous and well thought-out. As the longest-running Stamp Applications columnist, Jon is motivated by sharing his tricks and seeing others have similar rewards.

Lon is a Partner at Solutions Cubed, an electronic design firm in Chico, California. He graduated in 1994 with a BS in Electronic Engineering from CSU Chico. Solutions Cubed has developed electronic systems for use in deep-sea robotics, industrial motor control systems, communication protocol translators, and various other embedded control systems. Their clients include General Electric, Lockheed Martin, Agilent Technologies,

and Microchip Technologies, Inc. Systems developed by Solutions Cubed are in use worldwide, and have even found their way into NASA missions. When not involved in electronic design work Lon spends time with is wife Jennifer and son Becket, making use of the myriad of outdoor activities available in the Chico area.

About Nuts and Volts Magazine

The first issue of Nuts & Volts Magazine (www.nutsvolts.com) was published in March of 1980. It has since grown into one of the most popular and relevant magazines for the electronics hobbyist. The diversity of subjects appeals to all levels of experience and spans such topics as amateur robotics, lasers, computer control, home automation, microcontrollers, not to mention the popular BASIC Stamp.

A monthly tabloid-size publication, Nuts & Volts averages 96 to 100 pages and is crammed full of great hands-on information to help you explore the world of electronics and technology! A sampling of monthly columns includes Amateur Robotics, Electronics Q & A, Stamp Applications, Laser Insight, and Techknowledgey 2001. Feature articles, written by popular authors, round out the monthly line-up to take the reader on an interesting and educational foray into the world of electronics.

Subscription information is printed in each magazine, as well as elsewhere in this book. For Parallax customers, this is the most popular printed forum.

Technical Support

Assembling this book required support from three authors and Nuts and Volts Magazine. As much as this book is a technical resource and should answer questions, you will undoubtedly have questions since you will be armed with more knowledge. Although the authors work professionally with microcontrollers and may offer products for them, we suggest you do not contact them with questions about their columns. Each of them is employed and working on their next product or consulting job. This book was published by Parallax, Inc.

Parallax technical support may be contacted with specific questions. We can answer questions about the BASIC Stamp programming language and syntax, differences between BASIC Stamps and what type of projects might be possible with a BASIC

Stamp. If you are looking for code samples, chances are they've been written and we just need to point you in the right direction. To reach our technical support staff:

- By phone (916) 624-8333 during the hours of 8:00 AM to 5:00 PM Pacific Standard Time
- By e-mail to stamptech@parallaxinc.com

For quick support we recommend subscribing to the BASIC Stamp discussion group. With nearly 2,000 members (many are long-term customers) you'll get answers 24-hours a day. Subscribe at www.parallaxinc.com under the "Discussion Group" link.

Some Parts are Obsolete

The original content and format of each column has generally been preserved. Keep in mind that some of the electronic components used in several columns may no longer be available from their original source or manufacturer. Examples of parts that may no longer be available include surplus modem, speech chips and serial keypads. Sometimes, there are reasonable alternatives that could be used with only minor Stamp code modifications.

Parallax, Inc. makes no guarantees as to the availability of any components discussed herein and recommends checking with your local electronics supply stores for possible substitutes where applicable.

If you find that a part is obsolete and modify an application to work with a substitute, send your code and any changes made to the schematic to info@parallaxinc.com. We will update the product page featuring this book at www.parallaxinc.com and provide you free hardware (based on our sole discretion, of course).

Acknowledgements

Thanks are due to Scott Edwards, Jon Williams and Lon Glazner for being supportive of Parallax to print the book. These gentlemen are an inspiration for BASIC Stamp users everywhere with their unique project ideas.

Larry Lemieux, Nuts and Volts Magazine Editor has graciously supported his copyrighted material being published in print. Nuts and Volts Magazine uses their web site to complement their printed media by posting PDF versions of these columns. In time, all applications will be available for download from their web site.

Parallax's own staff also has a role. Ken Gracey assembled and prepared final edits on the book. Graphic Designer Jen Jacobs designed the cover for the book and takes the lead role in web and print marketing within our organization. Heaven Lemri Ouadrhiri learned Autocad so she could redraw many of the schematics used in this book. Jeff Martin incorporated the files onto our CD-ROM. Our sales, technical and warehouse staff will be on the back-end of the operation for the life of the book.

Column Overview and CD-ROM Files

An overview of what's in this book is very helpful before you get started. A CD-ROM included in the back has all pertinent BASIC Stamp source code, data sheets, software utilities. For each column these are identified in this table. The columns were written by the following authors:

- #1–29 by Scott Edwards
- #30–35, #37-44, #60-75 by Jon Williams
- #36 by Jeff Martin and John Barrowman
- #45 – 59 by Lon Glazner

Date	Title	Concepts Discussed	BASIC Stamp	Files on CD
(#1) March 1995	New Column Puts the Spotlight on BASIC Stamp Projects, Hints and Tips	Introduces the BS1-IC and a homemade carrier board.	Rev. D; BS1-IC	None
(#2) April 1995	Thermometer-on-a-Chip Simplifies Temperature Measurement	Measuring temperature with the DS1620 digital thermometer/thermostat; synchronous serial communication.	Rev. D; BS1-IC	DS1620 datasheet; DS1620.bas
(#3) May 1995	Adapt a Keypad for Pro-Quality Data Entry	Interface an off-the-shelf numeric keypad to the Stamp; sending data directly to a PC.	Rev. D; BS1-IC	FAKE_PAD.BAS OR_KEYS.BAS
(#4) June 1995	High-Precision Measurement Made Easy with new 12-bit Analog to Digital Converter	Use the two-channel LTC1298 with potentiometer inputs; proper use of SYMBOL in beginner's BASIC.	Rev. D; BS1-IC	LTC1298 datasheet; LTC1298.BAS
(#5) July 1995	Checking Battery Condition and Multiplexing I/O Lines	Monitoring battery voltage with a photocell pointed to an LED; doubling I/O with a 4051 multiplexer.	Rev. D; BS1-IC	BAT_MON.BAS; MULTIPOT.BAS; 4051 datasheet
(#6) August 1995	Silicon Steroids for the Stamp Help Your Projects Heft Big Loads – Using Switching Transistors	Useful high-voltage circuits with NPN transistors, Darlingtons, ULN2003 and ULN2803s.	Rev. D; BS1-IC; BS2-IC	2803 datasheet; 2003 datasheet
(#7) September 1995	DTMF "Touch" Tones are Music to the Ears of this Stamp Transmit/Receive Circuit	Encoding and decoding DTMF tones with the CM8880 transceiver; displaying numbers on a 1x16 serial LCD.	Rev. D; BS1-IC	DIAL.BAS; DTMF_RCV.BAS; CM8880 datasheet
(#8) October 1995	Rotary Encoders Help You Program a Friendly Spin and Grin Interface	Understanding sequence of bits from an encoder; using XOR; making jumpers to connect to carrier board posts.	Rev. D; BS1-IC	ROTARY.BAS 61C11 encoder datasheet
(#9) November 1995	Exterminating Common Bugs with Little-Known Stamp Info – Miscellaneous Tips and Techniques	Using the END instruction to sleep; resets during sleep; unwanted power resets; fixing power supply problems; simple math on numbers larger than 16 bits.	Rev. D; BS1-IC; BS2-IC	RJ_DEMO.BS2

Date	Title	Concepts Discussed	BASIC Stamp	Files on CD
(#10) December 1995	Put Your Data Up in Lights Using an LED Display Chip – Interfacing the MAX7219 LED Driver	Controlling five seven-segment common cathode LED displays with a serial interface; first steps to learn BASIC.	Rev. D; BS1-IC	MAX7219 datasheet; MAX7219.BAS
(#11) January 1996	Crystal-Controlled Oscillator is Heartbeat of 60-hour Timer – Precision Countdown Timer	Countdown timer with the 4060 counter / oscillator and a crystal; writing your first program with order of operation.	Rev. D; BS1-IC	ROT_TIME.BAS
(#12) February 1996	Model Rocket Project Aims High With BS1-IC Instrumentation – Measuring Rocket Acceleration and Velocity and Truth and Consequences with IF/THEN	Velocity probe using free-spinning propeller and IR LED with phototransistor; acceleration with CdS photocell in syringe (light moved by battery weight); using IF/THEN statements.	Rev. D; BS1-IC	RKT_ACC1.BAS; RLT_SPD.BAS
(#13) March 1996	When Good Luck is not Enough: Watchdogs and Error Recovery – Catching and Correcting Operating Errors with a few Bits of Boolean Logic	A PBASIC watchdog timer on a motor; timeout feature on BS2-ICs serial command provides "unstuck" capability; AND and OR type decisions with truth table.	Rev. D; BS1-IC; BS2-IC	NO_RESET.BS2; TIMOUT.BS2; WATCHDOG.BS2
(#14) April 1996	When You Feel that Need for Speed: Hotter Hardware and Swifter Software – Accelerating and Compiling PBASIC and More Boolean Logic	Spinning LED display required a fast program for BS1-IC; review of PIC BASIC Compiler; review of AND, OR, XOR, variations with NOT; addressing groups of I/O pins with DIRS command.	Rev. D; BS1-IC	SCANLED.BAS
(#15) May 1996	Understanding the RCTime Instruction and Creating Strings in EEPROM – BS2 Programming Tips	Understanding R/C curves and the BS2-IC's RCTIME command; storing sequence of bytes (strings) in EEPROM with DATA; decimal, Boolean and hex numbering systems.	BS2-IC	BSTRING.BS2; CSTRING.BS2
(#16) June 1996	Using BS2 Serial Communication: Serin and Serout Demystified – Plus the ABCs of ASCII Characters	Explanation of asynchronous serial communication; bit rates and baud modes; understanding of the ASCII characters.	BS2-IC	N/A
(#17) July 1996	Exploring the BS1 EEPROM With a Homemade Browser – Viewing and Modifying Long-Term Data	Writing data to EEPROM with program downloads and WRITE command; BSAVE to load protected programs.	Rev. D; BS1-IC	BS_PEEK.BAS
(#18) August 1996	Need Analog Output from the Stamp? Dial it in with a Digital Potentiometer – Using the DS1267 Potentiometer asa Versatile Digital-to-Analog Converter	Wiring pots for variable resistance or variable voltage; using the pot as a voltage divider; doing math with negative numbers with two's complement.	Rev. D; BS1-IC; BS2-IC	DS1267.BAS; DS1267.BS2; DS1267 datasheet

Date	Title	Concepts Discussed	BASIC Stamp	Files on CD
(#19) September 1996	Connect BS2 to Phone Lines, Give the BS1 an LED Display – Project Double-Header for the BASIC Stamps 1 and 2	DTMFOUT command to dial phone calls using a transformer and zener diodes; TSM6755 provides integrated LEDs and serial display driver combination; using binary coded decimal format numbers.	Rev. D; BS1-IC; BS2-IC	BCD_DEMO.BS2; LIIV_LED.BAS
(# 20) October 1996	Use the BS1's Debug Output for Stamp-PC Communication – Plus a Big-Digit Clock Demo for the BS2-IC	Intercepting DEBUG commands with your PC to view each byte of the Stamp's memory; using the NJU6355 real time clock and a 4x20 serial LCD to display large-formatted time.	Rev. D; BS1-IC; BS2-IC	BIG_TIME.BS2; DBUG.BAS; DBUG_IN.BAS; NJU6355 datasheet
(#21) November 1996	Look Into 'The Eye from TI' for Precision Light Readings – TSL230 Light-to-Frequency Chip Plus a Beginner's Race Timer Project	Using PULSIN command to measure pulse width as a frequency snapshot; simple race car timer project using pushbuttons.	Rev. D; BS1-IC; BS2-IC	TSL230.BAS; TSL230.BS2; TSL230 datasheet
(#22) December 1996	Scan a Keypad with the BS2 for Pushbutton User Input – 16-key Matrix Keypad Software Plus Beginner's Rate-Timer Project	Scanning a keypad using the NCD operator to determine bit position; developing race car timer code from pseudocode (a pidgin-English/BASIC); using the LOOKUP command.	Rev. D; BS1-IC	KEYP.BS2; RACE1.BAS
(#23) January 1997	Electronic Control for DC Motors Using Discrete Bridge Circuits – Gallery of Motor-Control Circuits and Motor-Control Basics	DC motor basics - control using manual and electronic switches; transistors and integrated motor controllers; H-bridge circuits and Darlingtons.	Rev. D; BS1-IC	MONDOMOT.BAS; L239 datasheet; LMD18200 datasheet
(#24) February 1997	Modem Lets Stamps Access Global Communication Network – Dialing for Stamp data and Beginner's Race Timer with Display	Brief look at the "AT" modem-control language and communication protocol; interfacing an external 9600 baud modem via Stamp serial port; completion of race car circuit with addition of LCD for race results.	Rev. D; BS1-IC; BS2-IC	ANSW_MDM.BAS; RACE2.BAS; LM339 datasheet
(#25) March 1997	Analog-to-Digital Conversion the Old-Fashioned Way – Using Comparators to Measure Voltage and a Total-Shutdown Power Supply	Using an LM339 comparator to measure unknown voltage; considerations about A/D response speed; using the National LP2951 low-dropout regulator to turn project completely off as an alternative to SLEEP and NAP.	Rev. D; BS1-IC; BS2-IC	COMP_AD1.BAS; COMP_AD2.BAS; COMP_AD2.BS2; TURNOFF.BAS; LP2950 datasheet
(#26) April 1997	Stamp Gives the Green Light to Efficient Programming – A Model Traffic Signal and Some Neat Stamp Peripherals	Build two stoplights and using a LOOKUP table to fetch data based on index; using OUTS to address more than one I/O pin at a time; brief review of Solutions Cubed Mini-Mods.	Rev. D; BS1-IC; BS2-IC	STOPLITE.BAS; STOPLITE.BS2

Date	Title	Concepts Discussed	BASIC Stamp	Files on CD
(#27) May 1997	Measure Water Level Without Getting Wet – Make a Sensitive Water Sensor from Hardware-Store Parts	Building a 4060 oscillator/divder circuit to measure water level in a tube with non-overlapping foil tapes.	BS2-IC	H20LEVEL.BAS; 74HC4060 datasheet
(#28) June 1997	Nifty Networking Chips Link Stamps Far and Wide – Use an RS-485 Transceiver for Reliable Network Comms	Explanation of LTC1457 RS-485 drivers; communication considerations and reference voltage levels; assigning each slave a reference ID.	Rev. D; BS1-IC	Mastr485.bas; Slave485.bas; 1487F datasheet
(# 29) July 1997	IC Temperature Sensors are Accurate and Flexible – Old-tech Sensors are Handy Where Newer Devices Don't Fit	Interfacing the LM34, LM35, LM335 to a BASIC Stamp through the low-cost 8-bit ADC0831 A/D converter.	Rev. D; BS1-IC	LCDTEMP.BAS; ADC0831 datasheet; LM134,34,35 datasheets
(#30) August 1997	PBASIC Programming With Style	Building PBASIC programs based on a plan; a clean template for new code; constant/variable naming conventions and formatting guidelines.	Rev. D; BS1-IC; BS2-IC	N/A
(#31) September 1997	Demystifying Character Based LCDs	Understanding the Hitachi HD44780 display and it's memory; Stamp connections and simple programming of the display.	Rev. D; BS1-IC; BS2-IC	LCDDEMO1.BAS; LCDDEMO1.BS2; LCDDEMO2.BAS
(#32) October 1997	Custom Characters	Creating custom characters in 5x7 format and displaying them; LCD hookups with the 74HC595 to save I/O pins; comparison to Scott Edwards' three-wire interface.	Rev. D; BS1-IC; BS2-IC	LCD595.BAS; LCD595.BS2; LCD5x10.BAS; LCD5x10.BS2; LCDCHRS.BAS; LCDCHRS.BS2; LCDDEMO1.BAS; LCDDEMO1.BS2; LCDDEMO2.BAS; LCDDEMO2.BS2; LCDREAD.BS2; 74HC595 datasheet
(#33) November 1997	It's Time to Get Real Using the Dallas Semiconductor 1302 – Part 1	BS2-IC project: interfacing with a real time clock and displaying data on a HD44780 LCD through the 74HC595; setting the clock.	BS2-IC	BS2CLOCK.BS2; DS1302 datasheet
(#34) December 1997	It's Time to Get Real Using the Dallas Semiconductor 1302 – Part 2	BS1-IC project of the above using a Pocket Watch B and Scott Edwards Serial LCD.	Rev. D; BS1-IC	BS1CLOCK.BAS; Pocket Watch datasheet
(#35) January 1998	Back to the Basics (PBASIC) With Fun and Games	PBASIC program flow stucture with GOTO, GOSUB, RETURN and BRANCH commands; producing an animated BS1-IC based slot machine.	Rev. D; BS1-IC	LASVEGAS.BAS
(#36) February 1998	Advanced Stamp Programming Techniques	Synthesizing a real-time clock; floating point math simulation; counting pulses on multiple I/O pins; use of the */ operator to work with remainders separately.	BS2-IC	COUNTS.BS2; STARSLSH.BS2; TENTHS.BS2; TIME.BS2

Date	Title	Concepts Discussed	BASIC Stamp	Files on CD
(#37) March 1998	Goin' GUI	Developing a pump station control with the G12864 graphical LCD; developing BMP graphics; writing and testing the code.	BS2-IC	PUMPs.BS2; G12864 datasheet
(#39) April 1998	Getting Back to the BS1-IC	Sharing I/O pins; using StampSize utility to read code and user data and display with text output; figuring resistor size for LEDs.	Rev. D; BS1-IC	BRANCH.BAS; SSDEMO.BAS; Stampsize software
(#39) May 1998	Building a Custom Digital Thermometer	Thermometer that displays current temp, high/low and graph of last hour's readings with the DS1620 and graphical LCD.	Rev. D; BS1-IC	RAMTEMP.BAS; RAMPack B datasheet
(#40) June 1998	Talk is Cheap!	Using the General Instruments Spo256-AL2 speech allophone processor; building an amplifier circuit; storing speech in the EEPROM.	Rev. D; BS1-IC	CONSTANT.BAS; TALKER.BAS
(#41) July 1998	Remote Control Stamping – Part 1	Visual BASIC program controls mini-Stamp network to establish bi-directional communication.	BS2-IC	PCTOBS2.BS2 Visual BASIC listings
(#42) August 1998	Remote Control Stamping – Part 2	Retrieving temperature from a remote BASIC Stamp; home-based control with XOUT.	BS2-IC	PC1620.BS2; PCx10.BS2; Visual BASIC listings
(#43) September 1998	Complimentary I/O	74HC165 parallel-in, serial out shift register for additional I/O snapshots.	Rev. D; BS1-IC	DIGIO.BAS; LTC1257.BAS; 74HC165 datasheet
(#44) November 1998	Timing is Everything	Emulating a timed software interrupt process; using EEMover to upload/download parameters to a BASIC Stamp.	BS2-IC	EEMOVER.BS2; SPDTEST.BS2; STATE.BS2; Visual BASIC listings
(#45) January 1999	Back to the Basics (Stamps, that is)!	Query to request topics by Lon Glazner for future Stamp Applications articles.	N/A	N/A
(#46) February 1999	Storing Data With the RAMPack B	Basic functions of the RAMPack B including data conversion, FIFO buffer; overview of electronic memory "types"	BS2-IC	RPB1_299.BS2; RPB2_299.BS2; SGX120 datasheet
(#47) March 1999	A Powerful Graphic Liquid Crystal Display (LCD)	Downloading bitmaps from the PC into the RAMPack B; displaying them on the Scott Edwards G12032 serial graphic LCD.	BS2-IC	LCD_399.BS2
(#48) April 1999	One Step Beyond the Application Note	Knowing what to look for in application notes; building a voltage tester with a DS1267 digital potentiometer.	N/A	NV_499.BAS; MM74HC40 datasheet
(#49) May 1999	Dual Digital Power Supply – Part 1	Using a 2x8 LCD in four-bit mode and a 4x4 keypad; first step of building a BS2-based power supply.	BS2-IC	MAY99.BS2
(#50) June 1999	Dual Digital Power Supply – Part 2	Integrate a DS1267-010 complete the dual power supply.	BS2-IC	JUNE99_4.BS2; MAX724 datasheet

Date	Title	Concepts Discussed	BASIC Stamp	Files on CD
(#51) July 1999	WWVB Clock Interface	Using the Ultralink WWVB receiver for a highly accurate time base; understanding the binary coded decimal format.	BS2-IC	NV_JULY99.BS2
(#52) August 1999	Staamp-Controlled High-Power H-Bridge	Build a 30V 30A high-power H-bridge using MOSFETs and the HIP4081A.	BS2-IC	NV_AUG.BS2
(#53) September 1999	Protecting Your Stamp From the Cold, Cruel World	Use of de-coupling capacitors; filtering incoming power supply; protective circuits for input pins.	N/A	N/A
(#54) October 1999	Faster, Stronger, Better: the BASIC Stamp 2-SX	Using multiple programs; current considerations; timing differences; modifications to commands.	BS2SX-IC	N/A
(#55) November 1999	Stamp Net Part 1 – A Multi-drop Stamp-based Network	Networking BS2SX modules using RS-485; master-slave configuration and communication; testing over cables.	BS2SX-IC	ANALOG.BSX; MASTER.BSX; MAX1487 datasheet
(#56) December 1999	Stamp Net Part 2 – A Multi-drop Stamp-based Network	Adding control for a 1A relay; detailing the master and slave transaction; review of communication protocol.	BS2SX-IC	ANALOG.BSX; MASTER.BSX; IOCONTROL.BSX
(#57) January 2000	Getting the Most Out of your 12-bit ADC	Overview of A/Ds (channels, resolution, interface); using low-pass filters and op-amps; defining a five-point process for building an accurate ADC-based system.	Rev. D; BS1-IC	NV100.BAS; MAX144-145 datasheet
(#58) February 2000	Motor Control Made Easy	Geared demo using the Motor Mind B; regulating motor speed; using the brake function, etc.	BS2-IC	MMDEMO.BS2
(#59) March 2000	A Digital-to-Analog Converter for All Seasons	Using the MAX5250 10-bit D/A converter with only minimal BASIC Stamp resources.	BS2-IC	DAC_AMP.BS2; MAX5250.PDF
(#60) April 2000	Calling All Stamps	Cermetek CH1786 modem interface with BASIC Stamp provides dial-up check on temperature using DS1620 digital thermometer.	BS2-IC	CERMETEK.BS2; CH1786 datasheet; AT commands
(#61) May 2000	Stamping Myself Into Better Shape	Constructing a simple exercise timer using four LEDs and a speaker; adding a hold switch to stop timing; applying timing concepts to other projects.	Rev. D; BS1-IC	XTIMER1.BAS; XTIMER2A.BAS; XTIMER2B.BAS; XTIMER2C.BAS; XTIMER3.BAS
(#62) June 2000	Menus Made Easy	Three-wire BASIC Stamp interface uses 74HC165 with six pushbuttons and HD44780 LCD to create a menu-driven user interface.	BS2-IC	STAMPUI.BS2; STAMPUI2.BS2
(#63) July 2000	Stamps in the Lab – Part 1	Complete review of StampPlot Lite software and it's graphing capability demonstrated with a DS1620 digital thermometer; graphing binary functions; quick Visual BASIC interface for Stamp-to-PC data transfer.	BS2-IC	TEMPPLOT.BS2; Visual BASIC listings

Date	Title	Concepts Discussed	BASIC Stamp	Files on CD
(#64) August 2000	Stamps in the Lab – Part 2	Receiving data from a Visual BASIC program to send back information.	BS2-IC	POLLSTMP.BS2; Polled Stamp interface
(#65)	A Talking Pet Trainer	Recording sounds on the ISD25xxx series chips and playing them back with Stamp control in "pushbutton mode".	BS2-IC	PARROT.BS2
(#66) October 2000	A Stamp-II ISD Sound Lab	Basics of the ISD2560 including using the end-of-message marker, branching to PBASIC code based on the ISD chip's mode; speaking pre-recorded numbers.	BS2-IC	ISD_LAB.BS2; SAYNUMBR.BS2
(#67) November 2000	Sound Ideas with the BASIC Stamp II	Dialing telephone tones with the DTMFOUT command; storing tunes in a LOOKUP table and playing them with FREQOUT; 'prototyping paradise' with the NX-1000 board.	BS2-IC	SOUNDS.BS2
(#68) December 2000	There's a New Stamp in Town – Part 1	Review of the BS2p24 and BS2p40's parallel LCD support; Dallas Semiconductor 1-wire support; Phillips I2C support.	BS2p24; BS2p40	DS1820.BSP; DS1820-X.BSP; PCF8583.BSP
(#69) January 2001	There's a New Stamp in Town – Part 2	I/O pin polling (firmware interrupts) and 40-pin BS2p.	BS2p24; BS2p40	N/A
(#70) February 2001	Let There Be LEDs	Using the MAX7219 LED display driver with 5x7 dot-matrix LEDs; interfacing a PC joystick for LED control.	BS2-IC	N/A
(#71) March 2001	Conversion Considerations	Converting code between BS2-IC, BS2SX, BS2E, BS2p24/40 modules; adjusting timing commands to work the same on each module.	BS2-IC; BS2E-IC; BS2SX; BS2p24/40	SHOWFREQ.BS2; SUBS.BSE; TASKER.BSE
(#72) April 2001	Searching the 1-Wire Bus	Reading serial numbers from a bus of 1-wire devices and identifying the number of devices present on the bus.	BS2p24; BS2p40	DSNAMES.BSP; OWSEARCH.BSP; SRCHDEMO.BSP
(#73) May 2001	Lookin' For The Light	Using different types of light sensors, including an R/C circuit with a CdS photocell; the TSL230 light to frequency device.	BS2-IC	N/A
(#74) June 2001	Sounding Off! Again – Part 1	Playing back sounds from the pre-recorded QV306M4-P module; short demos saying the time, date, numbers, etc.	BS2-IC	QV306M4P.BS2
(#75) July 2001	Sounding Off! Again – Part 2	Loading *.wav files into the QV306M4-P with the QV430P programmer; loading *.wav files with only a BASIC stamp.	BS2-IC	NOCRADLE.BS2; SOUNDFX.BS2; QV430P Manual